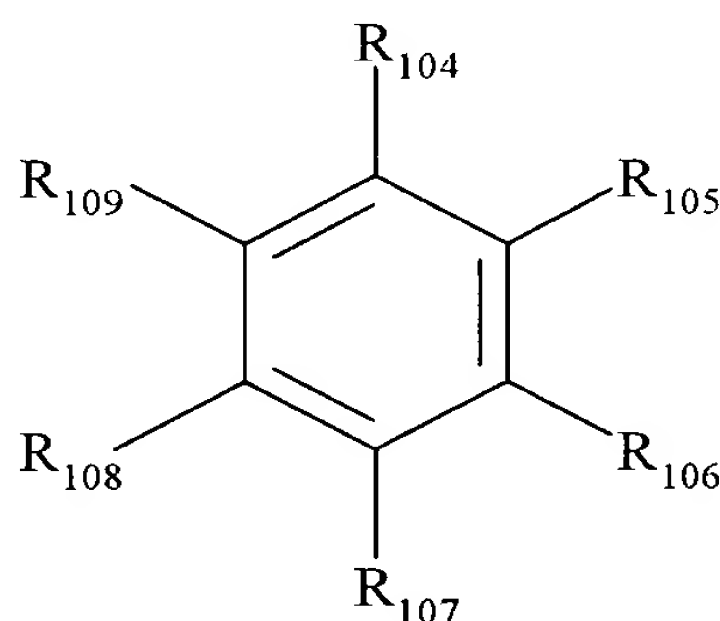


**Amendments to the Claims:**

Listing of Claims:

1. (Currently Amended) A method for inhibiting the polymer growth of living vinyl aromatic polymer previously formed in the presence of a nitroxyl inhibitor in admixture with vinyl aromatic monomer, comprising adding to said mixture a living polymer growth inhibiting amount of at least one inhibitor that is a hydrogen donor selected from the group consisting of inhibitors of the structure



wherein

R<sub>104</sub>, R<sub>105</sub>, R<sub>106</sub>, R<sub>107</sub>, R<sub>108</sub>, and R<sub>109</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR<sub>110</sub>, NR<sub>110</sub>R<sub>111</sub>, SR<sub>110</sub>, NO<sub>2</sub>, NO, CN, COR<sub>112</sub>, and halogen, and/or any two adjacent groups can be taken together to form ring structure(s) of five to seven members, provided that at least one of R<sub>104</sub>, R<sub>105</sub>, R<sub>106</sub>, R<sub>107</sub>, R<sub>108</sub>, and R<sub>109</sub> is OH or NHR<sub>110</sub> and at least one of R<sub>104</sub>, R<sub>105</sub>, R<sub>106</sub>, R<sub>107</sub>, R<sub>108</sub>, and R<sub>109</sub> is NO<sub>2</sub>;

R<sub>110</sub> and R<sub>111</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl,

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benzyl, cyclic, heterocyclic, substituted alkyl or aryl, or  $R_{110}$  and  $R_{111}$  can be taken together to form a ring structure of five to seven members;

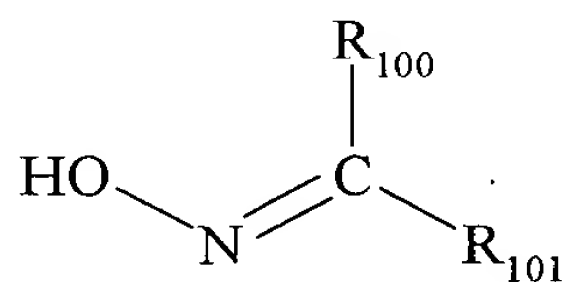
$R_{112}$  is  $R_{102}$ ,  $OR_{102}$ , or  $NR_{102}R_{103}$ ; and

$R_{102}$  and  $R_{103}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or  $R_{102}$  and  $R_{103}$  can be taken together to form a ring structure of five to seven members;

wherein said inhibitor is not present during the formation of the living vinyl aromatic polymer.

2 - 3 (Canceled)

4. (Withdrawn) The method of claim 1 further comprising an inhibitor is of the structure



wherein

$R_{100}$  and  $R_{101}$  are independently selected from the group consisting of hydrogen, alkyl, alkylidene, benzylidene, aryl, benzyl,  $COR_{102}$ ,  $COOR_{102}$ ,  $CONR_{102}R_{103}$ , cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or  $R_{100}$  and  $R_{101}$  can be taken together to form a ring structure of five to seven members; and

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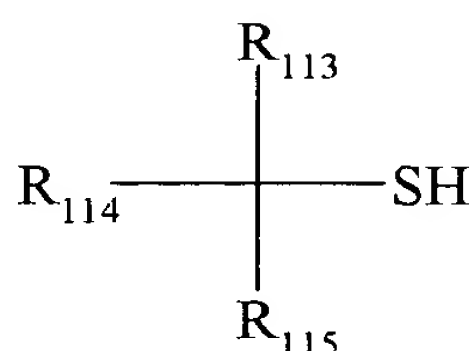
$R_{102}$  and  $R_{103}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or  $R_{102}$  and  $R_{103}$  can be taken together to form a ring structure of five to seven members.

5. (Canceled)
6. (Previously Presented) The method of claim 1 wherein  $R_{104}$  is OH.
7. (Withdrawn) The method of claim 6 wherein  $R_{107}$  is OH.
8. (Withdrawn) The method of claim 6 wherein  $R_{105}$  is OH.
9. (Original) The method of claim 6 wherein at least one of  $R_{105}$  and  $R_{107}$  is  $\text{NO}_2$ .
10. (Withdrawn) The method of claim 6 wherein at least one of  $R_{105}$  and  $R_{107}$  is NO.
11. (Withdrawn) The method of claim 5 1 wherein  $R_{104}$  is  $\text{NHR}_{110}$  and at least one of  $R_{105}$  and  $R_{107}$  is  $\text{NO}_2$ .

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12. (Withdrawn) The method of claim 5 1 wherein  $R_{104}$  is  $NHR_{110}$ ,  $R_{107}$  is  $NR_{110}R_{111}$ , and  $R_{111}$  is phenyl.

13. (Withdrawn) The method of claim 1 further comprising an inhibitor is of the structure



wherein  $R_{113}$ ,  $R_{114}$ , and  $R_{115}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, and heterocyclic moieties.

14 - 15 (Canceled)

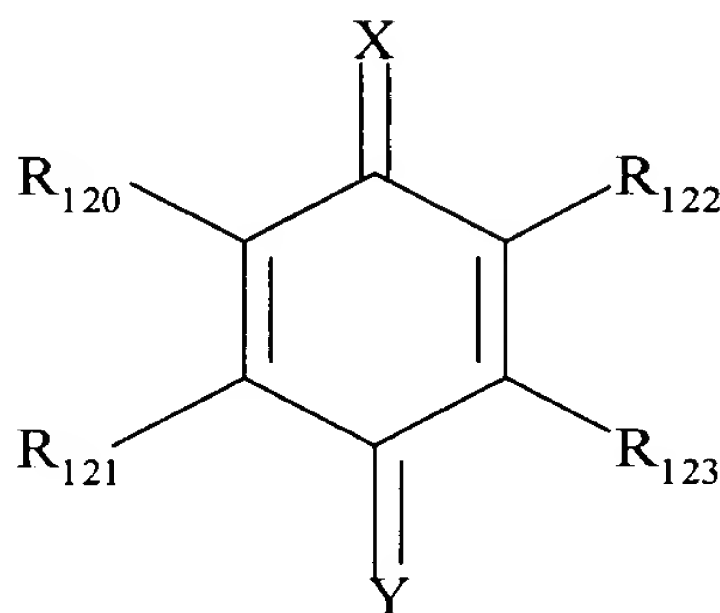
16. (Previously Presented) The method of claim 1 wherein a transition metal is added.

17. (Original) The method of claim 16 wherein the transition metal is copper.

18. (Withdrawn) The method of claim 1 further comprising an inhibitor that is an electron acceptor.

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19. (Withdrawn) The method of claim 18 wherein the inhibitor is of the structure



wherein

X and Y are independently selected from the group consisting of oxygen, NR<sub>110</sub>, and CR<sub>124</sub>R<sub>125</sub>;

R<sub>120</sub>, R<sub>121</sub>, R<sub>122</sub>, and R<sub>123</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR<sub>110</sub>, NR<sub>110</sub>R<sub>111</sub>, SR<sub>110</sub>, NO, NO<sub>2</sub>, CN, COR<sub>112</sub>, and halogen, or R<sub>120</sub> and R<sub>121</sub> can be taken together and/or R<sub>122</sub> and R<sub>123</sub> can be taken together to form one or two ring structures, respectively, either of which can be of five to seven members;

R<sub>124</sub> and R<sub>125</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR<sub>110</sub>, NR<sub>110</sub>R<sub>111</sub>, SR<sub>110</sub>, NO<sub>2</sub>, NO, CN, COR<sub>112</sub>, halogen, and/or can be taken together to form a ring structure of five to seven members;

R<sub>110</sub> and R<sub>111</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl,

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benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and COR<sub>102</sub>, or R<sub>110</sub> and R<sub>111</sub> can be taken together to form a ring structure of five to seven members;

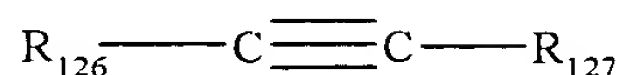
R<sub>112</sub> is R<sub>102</sub>, OR<sub>102</sub>, or NR<sub>102</sub>R<sub>103</sub>; and

R<sub>102</sub> and R<sub>103</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R<sub>102</sub> and R<sub>103</sub> can be taken together to form a ring structure of five to seven members.

20. (Withdrawn) The method of claim 19 wherein X and Y are oxygen.
21. (Withdrawn) The method of claim 19 wherein X is oxygen and Y is CR<sub>124</sub>R<sub>125</sub>.
22. (Withdrawn) The method of claim 19 wherein X is oxygen and Y is NR<sub>110</sub>.
23. (Withdrawn) The method of claim 19 wherein X and Y are NR<sub>110</sub>.
24. (Withdrawn) The method of claim 21 wherein X is NR<sub>110</sub> and Y is CR<sub>124</sub>R<sub>125</sub>.

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25. (Withdrawn) The method of claim 18 wherein the inhibitor is of the structure



wherein

$R_{126}$  and  $R_{127}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl,  $OR_{110}$ ,  $NR_{110}R_{111}$ ,  $SR_{110}$ ,  $NO_2$ ,  $NO$ ,  $CN$ ,  $COR_{112}$ , and halogen,

$R_{110}$  and  $R_{111}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and  $COR_{102}$  or  $R_{110}$  and  $R_{111}$  can be taken together to form a ring structure of five to seven members;

$R_{112}$  is  $R_{102}$ ,  $OR_{102}$ , or  $NR_{102}R_{103}$ ; and

$R_{102}$  and  $R_{103}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or  $R_{102}$  and  $R_{103}$  can be taken together to form a ring structure of five to seven members.

26. (Withdrawn) The method of claim 18 wherein the inhibitor is selected from the group consisting of phenylacetylene, 2,5-di-t-butyl-1,4-benzoquinone, 2,6-di-t-butyl-1,4-benzoquinone, 1,4-benzoquinone, 2-methylantraquinone, 1,4-naphthoquinone, 2,6-di-t-butyl-4-(phenylmethylene)-2,5-cyclohexadiene-1-one, 2,6-di-t-butyl-4-(phenylimino)-2,5-

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cyclohexadiene-1-one, and ethyl 3,4-bis-(3,5-di-t-butyl-4-one-2,5-cyclohexadienyldene)-  
hexane-1,6-dioate

27. (Withdrawn) The method of claim 18 wherein a transition metal is added.
28. (Withdrawn) The method of claim 27 wherein the transition metal is copper..
29. (Canceled)
30. (Previously Presented) Method of claim 1 wherein said vinyl aromatic monomer contains impurities from said monomer's production and/or purification processes.
31. (Previously Presented) Method of claim 1 wherein the mixture comprises polymer formed during said vinyl aromatic monomer's production and/or purification processes.
32. (Previously Presented) Method of claim 31 wherein the polymer formed during the production and/or purification processes is soluble in the vinyl aromatic monomer stream.



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33. (Previously Presented) Method of claim 31 wherein the polymer formed during the production and/or purification processes is insoluble in the vinyl aromatic monomer stream.

34. (Previously Presented) Method of claim 1 wherein said vinyl aromatic monomer is undergoing purification by distillation.

35. (Original) Method of claim 34 wherein the distillation process occurs at pressures less than 760 mm Hg.

36. (Original) Method of claim 34 wherein the distillation process is a continuous process.

37. (Original) Method of claim 34 wherein the equipment in which the distillation process occurs contains polymer.

38. (Previously Presented) Method of claim 37 wherein the polymer was formed during production and/or purification processes of vinyl aromatic monomer.

39. (Previously Presented) Method of claim 37 wherein the polymer is not dissolved in the vinyl aromatic monomer stream.

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40. (Previously Presented) Method of claim 34 wherein said vinyl aromatic monomer contains impurities from said vinyl aromatic monomer's production and/or purification processes.

41. (Previously Presented) Method of claim 34 wherein the mixture comprises vinyl aromatic polymer formed during the vinyl aromatic monomer's production and/or purification processes.

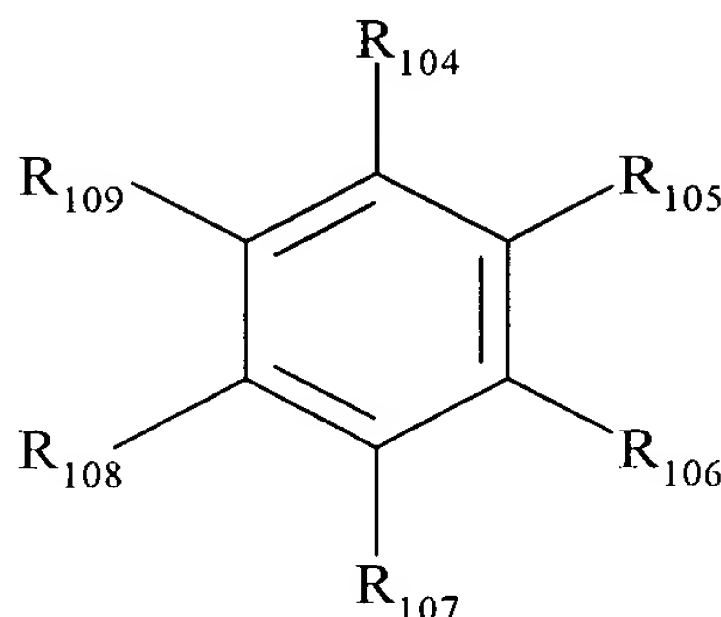
42. (Previously Presented) Method of claim 41 wherein the vinyl aromatic polymer formed during the vinyl aromatic monomer's production and/or purification processes is soluble in the vinyl aromatic monomer stream.

43. (Previously Presented) Method of claim 41 wherein the vinyl aromatic polymer formed during the vinyl aromatic monomer's production and/or purification processes is insoluble in the vinyl aromatic monomer stream.

44. (Currently Amended) A method for inhibiting the polymer growth of living vinyl aromatic polymer previously formed in the presence of a nitroxyl inhibitor in admixture with vinyl aromatic monomer, comprising adding to said mixture a living polymer growth inhibiting amount of

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A) at least one first inhibitor that is a hydrogen donor selected from the group consisting of inhibitors of the structure



wherein

R<sub>104</sub>, R<sub>105</sub>, R<sub>106</sub>, R<sub>107</sub>, R<sub>108</sub>, and R<sub>109</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR<sub>110</sub>, NR<sub>110</sub>R<sub>111</sub>, SR<sub>110</sub>, NO<sub>2</sub>, NO, CN, COR<sub>112</sub>, and halogen, and/or any two adjacent groups can be taken together to form ring structure(s) of five to seven members, provided that at least one of R<sub>104</sub>, R<sub>105</sub>, R<sub>106</sub>, R<sub>107</sub>, R<sub>108</sub>, and R<sub>109</sub> is OH or NHR<sub>110</sub> and at least one of R<sub>104</sub>, R<sub>105</sub>, R<sub>106</sub>, R<sub>107</sub>, R<sub>108</sub>, and R<sub>109</sub> is NO<sub>2</sub>;

R<sub>110</sub> and R<sub>111</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl, or R<sub>110</sub> and R<sub>111</sub> can be taken together to form a ring structure of five to seven members;

R<sub>112</sub> is R<sub>102</sub>, OR<sub>102</sub>, or NR<sub>102</sub>R<sub>103</sub>; and

R<sub>102</sub> and R<sub>103</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C,

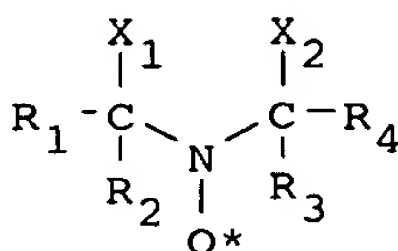
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O, N, S, or P, or R<sub>102</sub> and R<sub>103</sub> can be taken together to form a ring structure of five to seven members;

wherein said inhibitor is not present during the formation of the living vinyl aromatic polymer;

and

B) at least one second inhibitor having the following structural formula:



wherein

R<sub>1</sub> and R<sub>4</sub> are independently selected from the group consisting of hydrogen, alkyl, and heteroatom-substituted alkyl;

R<sub>2</sub> and R<sub>3</sub> are independently selected from the group consisting of alkyl and heteroatom-substituted alkyl; and

X<sub>1</sub> and X<sub>2</sub>

(1) are independently selected from the group consisting of halogen, cyano, amido, -S-C<sub>6</sub>H<sub>5</sub>, carbonyl, alkenyl, alkyl of 1 to 15 carbon atoms, COOR<sub>7</sub>, -S-COR<sub>7</sub>, and -OCOR<sub>7</sub>, wherein R<sub>7</sub> is alkyl or aryl, or

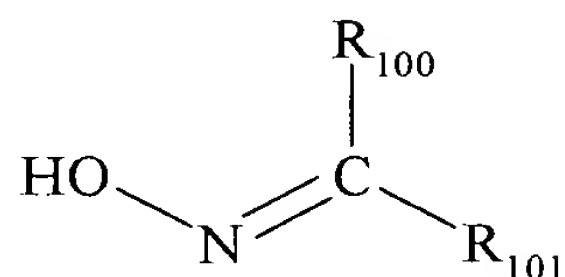
(2) taken together, form a ring structure with the nitrogen.

45. (Canceled)

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46. (Canceled)

47. (Withdrawn) The method of claim 44 further comprising an inhibitor ~~is~~ of the structure



wherein

R<sub>100</sub> and R<sub>101</sub> are independently selected from the group consisting of hydrogen, alkyl, alkylidene, benzylidene, aryl, benzyl, COR<sub>102</sub>, COOR<sub>102</sub>, CONR<sub>102</sub>R<sub>103</sub>, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R<sub>100</sub> and R<sub>101</sub> can be taken together to form a ring structure of five to seven members; and

R<sub>102</sub> and R<sub>103</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R<sub>102</sub> and R<sub>103</sub> can be taken together to form a ring structure of five to seven members.

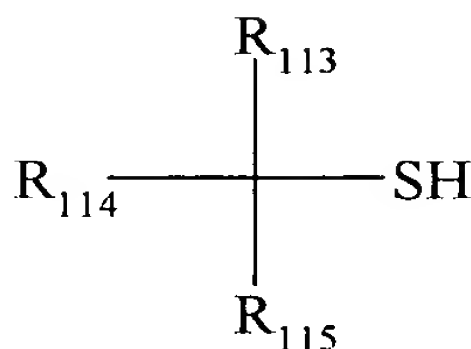
48. (Canceled)

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49. (Previously Presented) The method of claim 44 wherein  $R_{104}$  is OH.
50. (Withdrawn) The method of claim 49 wherein  $R_{107}$  is OH.
51. (Withdrawn) The method of claim 49 wherein  $R_{105}$  is OH.
52. (Original) The method of claim 49 wherein at least one of  $R_{105}$  and  $R_{107}$  is  $\text{NO}_2$ .
53. (Withdrawn) The method of claim 49 wherein at least one of  $R_{105}$  and  $R_{107}$  is NO.
54. (Withdrawn) The method of claim 44 wherein  $R_{104}$  is  $\text{NHR}_{110}$  and at least one of  $R_{105}$  and  $R_{107}$  is  $\text{NO}_2$ .
55. (Withdrawn) The method of claim 44 wherein  $R_{104}$  is  $\text{NHR}_{110}$ ,  $R_{107}$  is  $\text{NR}_{110}\text{R}_{111}$ , and  $R_{111}$  is phenyl.

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56. (Withdrawn) The method of claim 44 further comprising an inhibitor is of the structure



wherein  $R_{113}$ ,  $R_{114}$ , and  $R_{115}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, and heterocyclic moieties.

57 - 58 (Canceled)

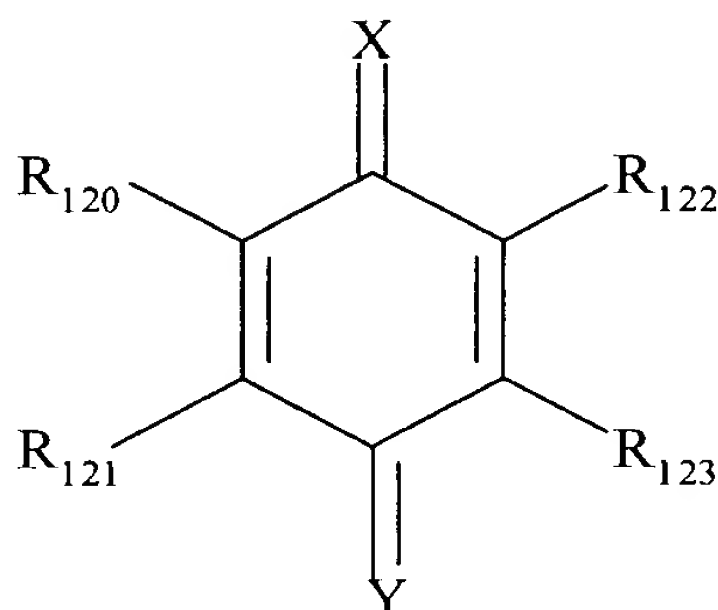
59. (Previously Presented) The method of claim 44 wherein a transition metal is added.

60. (Original) The method of claim 59 wherein the transition metal is copper.

61. (Withdrawn) The method of claim 44 further comprising an inhibitor that is an electron acceptor.

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62. (Withdrawn) The method of claim 61 wherein the inhibitor is of the structure



wherein

X and Y are independently selected from the group consisting of oxygen, NR<sub>110</sub>, and CR<sub>124</sub>R<sub>125</sub>;

R<sub>120</sub>, R<sub>121</sub>, R<sub>122</sub>, and R<sub>123</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR<sub>110</sub>, NR<sub>110</sub>R<sub>111</sub>, SR<sub>110</sub>, NO, NO<sub>2</sub>, CN, COR<sub>112</sub>, and halogen, or R<sub>120</sub> and R<sub>121</sub> can be taken together and/or R<sub>122</sub> and R<sub>123</sub> can be taken together to form one or two ring structures, respectively, either of which can be of five to seven members;

R<sub>124</sub> and R<sub>125</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR<sub>110</sub>, NR<sub>110</sub>R<sub>111</sub>, SR<sub>110</sub>, NO<sub>2</sub>, NO, CN, COR<sub>112</sub>, halogen, and/or can be taken together to form a ring structure of five to seven members;



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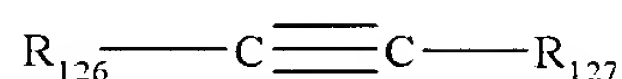
$R_{110}$  and  $R_{111}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and  $COR_{102}$ , or  $R_{110}$  and  $R_{111}$  can be taken together to form a ring structure of five to seven members;

$R_{112}$  is  $R_{102}$ ,  $OR_{102}$ , or  $NR_{102}R_{103}$ ; and

$R_{102}$  and  $R_{103}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or  $R_{102}$  and  $R_{103}$  can be taken together to form a ring structure of five to seven members.

63. (Withdrawn) The method of claim 62 wherein X and Y are oxygen.
64. (Withdrawn) The method of claim 62 wherein X is oxygen and Y is  $CR_{124}R_{125}$ .
65. (Withdrawn) The method of claim 62 wherein X is oxygen and Y is  $NR_{110}$ .
66. (Withdrawn) The method of claim 62 wherein X and Y are  $NR_{110}$ .
67. (Withdrawn) The method of claim 62 wherein X is  $NR_{110}$  and Y is  $CR_{124}R_{125}$ .

68. (Withdrawn) The method of claim 55 further comprising an inhibitor ~~is~~ of the structure



wherein

$R_{126}$  and  $R_{127}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl,  $OR_{110}$ ,  $NR_{110}R_{111}$ ,  $SR_{110}$ ,  $NO_2$ ,  $NO$ ,  $CN$ ,  $COR_{112}$ , and halogen,

$R_{110}$  and  $R_{111}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and  $COR_{102}$  or  $R_{110}$  and  $R_{111}$  can be taken together to form a ring structure of five to seven members;

$R_{112}$  is  $R_{102}$ ,  $OR_{102}$ , or  $NR_{102}R_{103}$ ; and

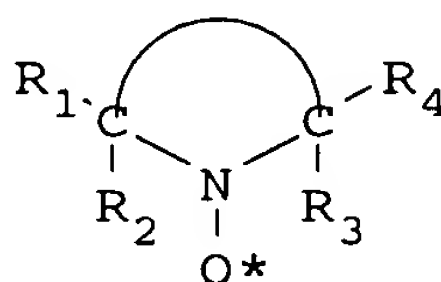
$R_{102}$  and  $R_{103}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or  $R_{102}$  and  $R_{103}$  can be taken together to form a ring structure of five to seven members.

69. (Withdrawn) The method of claim 61 wherein the first inhibitor is selected from the group consisting of phenylacetylene, 2,5-di-t-butyl-1,4-benzoquinone, 2,6-di-t-butyl-1,4-benzoquinone, 1,4-benzoquinone, 2-methylantraquinone, 1,4-naphthoquinone, 2,6-di-t-butyl-4-(phenylmethylene)-2,5-cyclohexadiene-1-one, 2,6-di-t-butyl-4-(phenylimino)-2,5-

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cyclohexadiene-1-one, and ethyl 3,4-bis-(3,5-di-t-butyl-4-one-2,5-cyclohexadienylidene)-hexane-1,6-dioate.

70. (Withdrawn) The method of claim 61 wherein a transition metal is added.
71. (Withdrawn) The method of claim 70 wherein the transition metal is copper.
72. (Withdrawn) The method of claim 44 wherein the first inhibitor is a blend of a hydrogen donor and an electron acceptor.
73. (Original) The method of claim 44 wherein the second inhibitor is of the structure



wherein  $R_1$  and  $R_4$  are independently selected from the group consisting of hydrogen, alkyl, and heteroatom-substituted alkyl and  $R_2$  and  $R_3$  are independently selected from the group consisting of alkyl and heteroatom-substituted alkyl, and the



portion represents the atoms necessary to form a five-, six-, or seven-membered heterocyclic

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ring.

74. (Withdrawn) The method of claim 44 wherein the second inhibitor is a blend of two nitroxyls.

75. (Original) The method of claim 73 wherein the second inhibitor contains one or more nitroxyls selected from the group consisting of:

N,N-di-*tert*-butylnitroxide;

N,N-di-*tert*-amylnitroxide;

N-*tert*-butyl-2-methyl-1-phenyl-propylnitroxide;

N-*tert*-butyl-1-diethylphosphono-2,2-dimethylpropylnitroxide;

2,2,6,6-tetramethyl-piperidinyloxy;

4-amino-2,2,6,6-tetramethyl-piperidinyloxy;

4-hydroxy-2,2,6,6-tetramethyl-piperidinyloxy;

4-oxo-2,2,6,6-tetramethyl-piperidinyloxy;

4-dimethylamino-2,2,6,6-tetramethyl-piperidinyloxy;

4-ethanoyloxy-2,2,6,6-tetramethyl-piperidinyloxy;

2,2,5,5-tetramethylpyrrolidinyloxy;

3-amino-2,2,5,5-tetramethylpyrrolidinyloxy;

2,2,4,4-tetramethyl-1-oxa-3-azacyclopentyl-3-oxy;

2,2,4,4-tetramethyl-1-oxa-3-pyrrolinyl-1-oxy-3-carboxylic acid;

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2,2,3,3,5,5,6,6-octamethyl-1,4-diazacyclohexyl-1,4-dioxy;  
4-bromo-2,2,6,6-tetramethyl-piperidinyloxy;  
4-chloro-2,2,6,6-tetramethyl-piperidinyloxy;  
4-iodo-2,2,6,6-tetramethyl-piperidinyloxy;  
4-fluoro-2,2,6,6-tetramethyl-piperidinyloxy;  
4-cyano-2,2,6,6-tetramethyl-piperidinyloxy;  
4-carboxy-2,2,6,6-tetramethyl-piperidinyloxy;  
4-carbomethoxy-2,2,6,6-tetramethyl-piperidinyloxy;  
4-carbethoxy-2,2,6,6-tetramethyl-piperidinyloxy;  
4-cyano-4-hydroxy-2,2,6,6-tetramethyl-piperidinyloxy;  
4-methyl-2,2,6,6-tetramethyl-piperidinyloxy;  
4-carbethoxy-4-hydroxy-2,2,6,6-tetramethyl-piperidinyloxy;  
4-hydroxy-4-(1-hydroxypropyl)-2,2,6,6-tetramethyl-piperidinyloxy;  
4-methyl-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;  
4-carboxy-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;  
4-carbomethoxy-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;  
4-carbethoxy-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;  
4-amino-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;  
4-amido-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;  
3,4-diketo-2,2,5,5-tetramethylpyrrolidinyloxy;  
3-keto-4-oximino-2,2,5,5-tetramethylpyrrolidinyloxy;

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3-keto-4-benzylidene-2,2,5,5-tetramethylpyrrolidinyloxy;  
3-keto-4,4-dibromo-2,2,5,5-tetramethylpyrrolidinyloxy;  
2,2,3,3,5,5-hexamethylpyrrolidinyloxy;  
3-carboximido-2,2,5,5-tetramethylpyrrolidinyloxy;  
3-oximino-2,2,5,5-tetramethylpyrrolidinyloxy;  
3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;  
3-cyano-3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;  
3-carbomethoxy-3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;  
3-carbethoxy-3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;  
2,2,5,5-tetramethyl-3-carboxamido-2,5-dihydropyrrole-1-oxyl;  
2,2,5,5-tetramethyl-3-amino-2,5-dihydropyrrole-1-oxyl;  
2,2,5,5-tetramethyl-3-carbethoxy-2,5-dihydropyrrole-1-oxyl;  
2,2,5,5-tetramethyl-3-cyano-2,5-dihydropyrrole-1-oxyl;  
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)succinate;  
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)adipate;  
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)sebacate;  
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)n-butylmalonate;  
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)phthalate;  
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)isophthalate;  
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)terephthalate;  
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)hexahydroterephthalate;

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N,N'-bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)adipamide;

N-(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)-caprolactam;

N-(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)-dodecylsuccinimide;

2,4,6-tris-[N-butyl-N-(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)]-s-triazine; and

4,4'-ethylenebis(1-oxyl-2,2,6,6-tetramethylpiperazin-3-one).

76. (Previously Presented) Method of claim 44 wherein said vinyl aromatic monomer contains impurities from said monomer's production and/or purification processes.

77. (Previously Presented) Method of claim 44 wherein the mixture comprises polymer formed during said vinyl monomer's production and/or purification processes.

78. (Previously Presented) Method of claim 77 wherein the polymer formed during the production and/or purification processes is soluble in the vinyl aromatic monomer stream.

79. (Previously Presented) Method of claim 77 wherein the polymer formed during the production and/or purification processes is insoluble in the vinyl aromatic monomer stream.

80. (Previously Presented) Method of claim 44 wherein said vinyl aromatic monomer is undergoing purification by distillation.

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81. (Original) Method of claim 80 wherein the distillation process occurs at pressures less than 760 mm Hg.

82. (Original) Method of claim 80 wherein the distillation process is a continuous process.

83. (Original) Method of claim 80 wherein the equipment in which the distillation process occurs contains polymer.

84. (Previously Presented) Method of claim 83 wherein the polymer was formed during production and/or purification processes of vinyl aromatic monomer.

85. (Previously Presented) Method of claim 83 wherein the polymer is not dissolved in the vinyl aromatic monomer stream.

86. (Previously Presented) Method of claim 80 wherein said vinyl aromatic monomer contains impurities from said vinyl aromatic monomer's production and/or purification processes.

87. (Previously Presented) Method of claim 80 wherein the mixture comprises vinyl aromatic polymer formed during the vinyl aromatic monomer's production and/or purification



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processes.

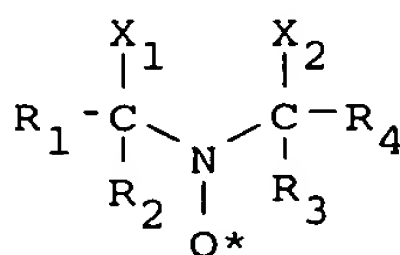
88. (Previously Presented) Method of claim 87 wherein the vinyl aromatic polymer formed during the vinyl aromatic monomer's production and/or purification processes is soluble in the vinyl aromatic monomer stream.

89. (Previously Presented) Method of claim 87 wherein the vinyl aromatic polymer formed during the vinyl aromatic monomer's production and/or purification processes is insoluble in the vinyl aromatic monomer stream.

90. (Withdrawn) A composition comprising:

A) at least one first inhibitor that is a hydrogen donor or an electron acceptor and

B) at least one second inhibitor having the following structural formula:



wherein

R<sub>1</sub> and R<sub>4</sub> are independently selected from the group consisting of hydrogen, alkyl, and heteroatom-substituted alkyl;

R<sub>2</sub> and R<sub>3</sub> are independently selected from the group consisting of alkyl and heteroatom-substituted alkyl; and

X<sub>1</sub> and X<sub>2</sub>

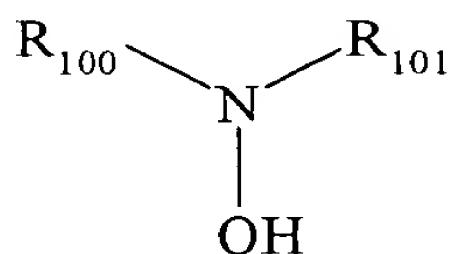
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(1) are independently selected from the group consisting of halogen, cyano, amido,  $-S-C_6H_5$ , carbonyl, alkenyl, alkyl of 1 to 15 carbon atoms,  $COOR_7$ ,  $-S-COR_7$ , and  $-OCOR_7$ , wherein  $R_7$  is alkyl or aryl, or

(2) taken together, form a ring structure with the nitrogen.

91. (Withdrawn) The composition of claim 90 wherein the first inhibitor is a hydrogen donor.

92. (Withdrawn) The composition of claim 91 wherein the first inhibitor is of the structure



wherein

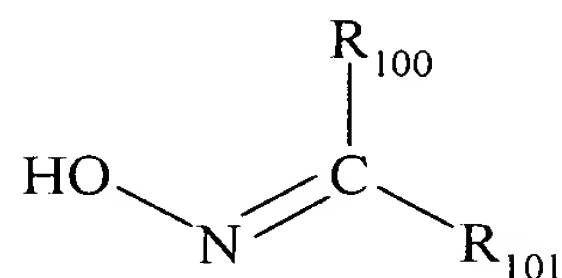
$R_{100}$  and  $R_{101}$  are independently selected from the group consisting of hydrogen, alkyl, alkylidene, benzylidene, aryl, benzyl,  $COR_{102}$ ,  $COOR_{102}$ ,  $CONR_{102}R_{103}$ , cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or  $R_{100}$  and  $R_{101}$  can be taken together to form a ring structure of five to seven members; and

$R_{102}$  and  $R_{103}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C,

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O, N, S, or P, or  $R_{102}$  and  $R_{103}$  can be taken together to form a ring structure of five to seven members.

93. (Withdrawn) The composition of claim 91 wherein the first inhibitor is of the structure



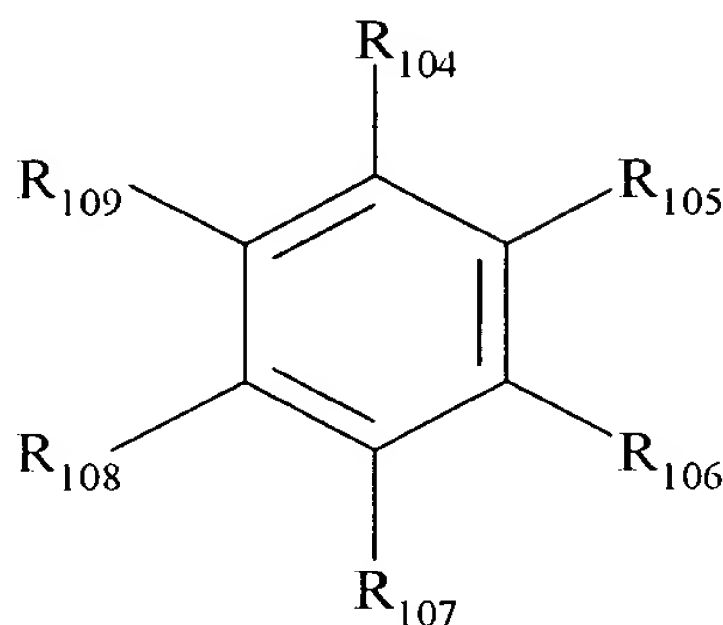
wherein

$R_{100}$  and  $R_{101}$  are independently selected from the group consisting of hydrogen, alkyl, alkylidene, benzylidene, aryl, benzyl,  $COR_{102}$ ,  $COOR_{102}$ ,  $CONR_{102}R_{103}$ , cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or  $R_{100}$  and  $R_{101}$  can be taken together to form a ring structure of five to seven members; and

$R_{102}$  and  $R_{103}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or  $R_{102}$  and  $R_{103}$  can be taken together to form a ring structure of five to seven members.

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94. (Withdrawn) The composition of claim 91 wherein the first inhibitor is of the structure



wherein

R<sub>104</sub>, R<sub>105</sub>, R<sub>106</sub>, R<sub>107</sub>, R<sub>108</sub>, and R<sub>109</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR<sub>110</sub>, NR<sub>110</sub>R<sub>111</sub>, SR<sub>110</sub>, NO<sub>2</sub>, NO, CN, COR<sub>112</sub>, halogen, and/or any two adjacent groups can be taken together to form ring structure(s) of five to seven members, provided that at least one of R<sub>104</sub>, R<sub>105</sub>, R<sub>106</sub>, R<sub>107</sub>, R<sub>108</sub>, and R<sub>109</sub> is OH or NHR<sub>110</sub>;

R<sub>110</sub> and R<sub>111</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and COR<sub>102</sub>, or R<sub>110</sub> and R<sub>111</sub> can be taken together to form a ring structure of five to seven members;

R<sub>112</sub> is R<sub>102</sub>, OR<sub>102</sub>, or NR<sub>102</sub>R<sub>103</sub>; and

R<sub>102</sub> and R<sub>103</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C,

1. *Journal of the American Medical Association*, 1997; 278: 1039-1044.

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95. (Withdrawn) The composition of claim 94 wherein  $R_{104}$  is OH.

96. (Withdrawn) The composition of claim 95 wherein R<sub>107</sub> is OH.

97. (Withdrawn) The composition of claim 95 wherein R<sub>105</sub> is OH.

98. (Withdrawn) The composition of claim 95 wherein at least one of R<sub>105</sub> and R<sub>107</sub> is NO<sub>2</sub>.

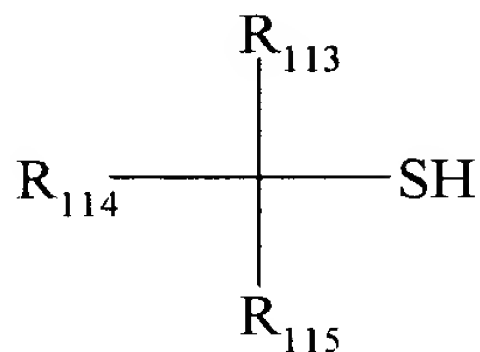
99. (Withdrawn) The composition of claim 95 wherein at least one of R<sub>105</sub> and R<sub>107</sub> is NO.

100. (Withdrawn) The composition of claim 94 wherein  $R_{104}$  is  $NHR_{110}$  and at least one of  $R_{105}$  and  $R_{107}$  is  $NO_2$ .

101. Withdrawn) The composition of claim 94 wherein  $R_{104}$  is  $NHR_{110}$ ,  $R_{107}$  is  $NR_{110}R_{111}$ , and  $R_{111}$  is phenyl.

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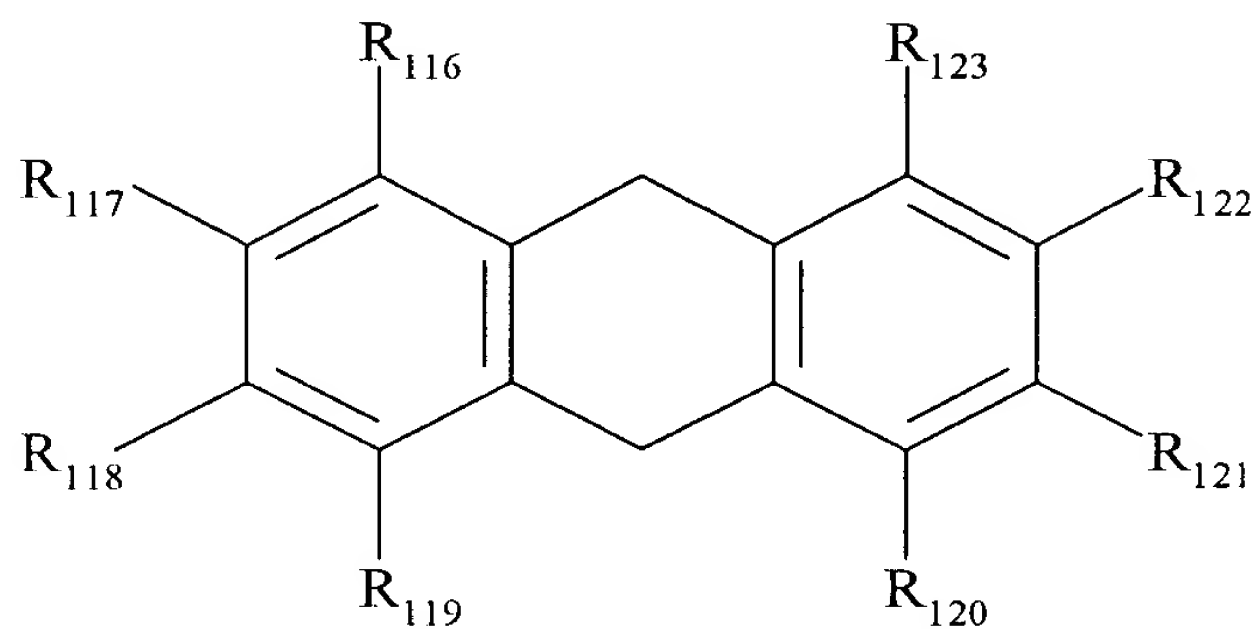
102. (Withdrawn) The composition of claim 91 wherein the first inhibitor is of the structure



wherein

R<sub>113</sub>, R<sub>114</sub>, and R<sub>115</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, and heterocyclic moieties.

103. (Withdrawn) The composition of claim 91 wherein the first inhibitor is of the structure



wherein

R<sub>116</sub>, R<sub>117</sub>, R<sub>118</sub>, R<sub>119</sub>, R<sub>120</sub>, R<sub>121</sub>, R<sub>122</sub>, and R<sub>123</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl,

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substituted aryl,  $\text{OR}_{110}$ ,  $\text{NR}_{110}\text{R}_{111}$ ,  $\text{SR}_{110}$ ,  $\text{NO}_2$ ,  $\text{NO}$ ,  $\text{CN}$ ,  $\text{COR}_{112}$ , halogen, and/or any two adjacent groups can be taken together to form ring structure(s) of five to seven members;

$\text{R}_{110}$  and  $\text{R}_{111}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and  $\text{COR}_{102}$  or  $\text{R}_{110}$  and  $\text{R}_{111}$  can be taken together to form a ring structure of five to seven members;

$\text{R}_{112}$  is  $\text{R}_{102}$ ,  $\text{OR}_{102}$ , or  $\text{NR}_{102}\text{R}_{103}$ ; and

$\text{R}_{102}$  and  $\text{R}_{103}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or  $\text{R}_{102}$  and  $\text{R}_{103}$  can be taken together to form a ring structure of five to seven members.

104. (Withdrawn) The composition of claim 91 wherein the first inhibitor is selected from the group consisting of diethylhydroxylamine, cyclohexanoneoxime, dibenzylhydroxylamine, 2,4-dinitro-6-sec-butylphenol, N-phenyl-N'-(1,4-dimethylpentyl)-para-phenylenediamine, 2,5-di-t-butylhydroquinone, 2,5-di-t-amylhydroquinone, methylhydroquinone, 4-t-butylhydroquinone, 4-t-butylcatechol, octanethiol, 2,6-di-t-butyl-4-ethylphenol/Cu(I)naphthenate, dihydroanthracene, N-t-butyl-2-benzothiazole-sulfenamide, and N-methyl-4-nitroaniline.

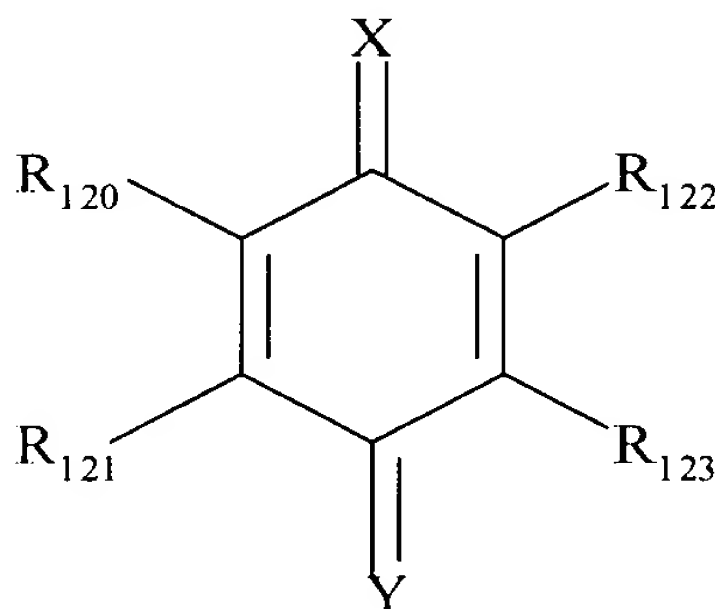
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105. (Withdrawn) The composition of claim 91 wherein a transition metal is added.

106. (Withdrawn) The composition of claim 105 wherein the transition metal is copper.

107. (Withdrawn) The composition of claim 90 wherein the first inhibitor is an electron acceptor.

108. (Withdrawn) The composition of claim 107 wherein the first inhibitor is of the structure



wherein

X and Y are independently selected from the group consisting of oxygen, NR<sub>110</sub>, and

CR<sub>124</sub>R<sub>125</sub>;

R<sub>120</sub>, R<sub>121</sub>, R<sub>122</sub>, and R<sub>123</sub> are independently selected from the group consisting of hydrogen,

alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR<sub>110</sub>,

NR<sub>110</sub>R<sub>111</sub>, SR<sub>110</sub>, NO, NO<sub>2</sub>, CN, COR<sub>112</sub>, and halogen, or R<sub>120</sub> and R<sub>121</sub> can be taken

together and/or R<sub>122</sub> and R<sub>123</sub> can be taken together to form one or two ring structures,



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respectively, either of which can be of five to seven members;

$R_{124}$  and  $R_{125}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl,  $OR_{110}$ ,  $NR_{110}R_{111}$ ,  $SR_{110}$ ,  $NO_2$ ,  $NO$ ,  $CN$ ,  $COR_{112}$ , halogen, and/or can be taken together to form a ring structure of five to seven members,

$R_{110}$  and  $R_{111}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and  $COR_{102}$ , or  $R_{110}$  and  $R_{111}$  can be taken together to form a ring structure of five to seven members;

$R_{112}$  is  $R_{102}$ ,  $OR_{102}$ , or  $NR_{102}R_{103}$ ; and

$R_{102}$  and  $R_{103}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or  $R_{102}$  and  $R_{103}$  can be taken together to form a ring structure of five to seven members.

109. (Withdrawn) The composition of claim 108 wherein X and Y are oxygen.

110. (Withdrawn) The composition of claim 108 wherein X is oxygen and Y is  $CR_{124}R_{125}$ .

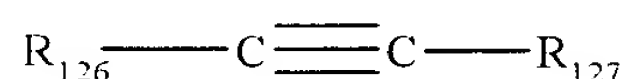
111. (Withdrawn) The composition of claim 108 wherein X is oxygen and Y is  $NR_{110}$ .

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112. (Withdrawn) The composition of claim 108 wherein X and Y are  $\text{NR}_{110}$ .

113. (Withdrawn) The composition of claim 112 wherein X is  $\text{NR}_{110}$  and Y is  $\text{CR}_{124}\text{R}_{125}$ .

114. (Withdrawn) The composition of claim 107 wherein the inhibitor is of the structure



wherein

$\text{R}_{126}$  and  $\text{R}_{127}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl,  $\text{OR}_{110}$ ,  $\text{NR}_{110}\text{R}_{111}$ ,  $\text{SR}_{110}$ ,  $\text{NO}_2$ ,  $\text{NO}$ ,  $\text{CN}$ ,  $\text{COR}_{112}$ , and halogen;

$\text{R}_{110}$  and  $\text{R}_{111}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and  $\text{COR}_{102}$  or  $\text{R}_{110}$  and  $\text{R}_{111}$  can be taken together to form a ring structure of five to seven members;

$\text{R}_{112}$  is  $\text{R}_{102}$ ,  $\text{OR}_{102}$ , or  $\text{NR}_{102}\text{R}_{103}$ ; and

$\text{R}_{102}$  and  $\text{R}_{103}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or  $\text{R}_{102}$  and  $\text{R}_{103}$  can be taken together to form a ring structure of five to seven members.



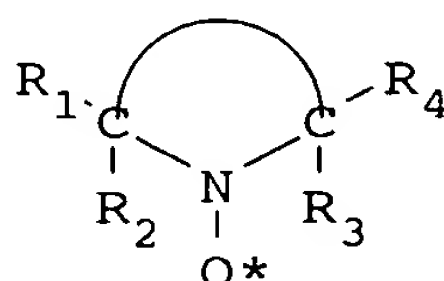
hexane-1,6-dioate.

116. (Withdrawn) The composition of claim 107 wherein a transition metal is added.

117. (Withdrawn) The composition of claim 116 wherein the transition metal is copper.

118. (Withdrawn) The composition of claim 90 wherein the first inhibitor is a blend of a

119. (Withdrawn) The composition of claim 90 wherein the second inhibitor is of the



wherein R<sub>1</sub> and R<sub>4</sub> are independently selected from the group consisting of hydrogen, alkyl,

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consisting of alkyl and heteroatom-substituted alkyl, and the



portion represents the atoms necessary to form a five-, six-, or seven-membered heterocyclic ring.

120. (Withdrawn) The composition of claim 90 wherein the second inhibitor is a blend of two nitroxyls.

121. (Withdrawn) The composition of claim 119 wherein the second inhibitor contains one or more nitroxyls selected from the group consisting of:

N,N-di-*tert*-butylnitroxide;

N,N-di-*tert*-amylnitroxide;

N-*tert*-butyl-2-methyl-1-phenyl-propylnitroxide;

N-*tert*-butyl-1-diethylphosphono-2,2-dimethylpropylnitroxide;

2,2,6,6-tetramethyl-piperidinyloxy;

4-amino-2,2,6,6-tetramethyl-piperidinyloxy;

4-hydroxy-2,2,6,6-tetramethyl-piperidinyloxy;

4-oxo-2,2,6,6-tetramethyl-piperidinyloxy;

4-dimethylamino-2,2,6,6-tetramethyl-piperidinyloxy;

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4-ethanoyloxy-2,2,6,6-tetramethyl-piperidinyloxy;  
2,2,5,5-tetramethylpyrrolidinyloxy;  
3-amino-2,2,5,5-tetramethylpyrrolidinyloxy;  
2,2,4,4-tetramethyl-1-oxa-3-azacyclopentyl-3-oxy;  
2,2,4,4-tetramethyl-1-oxa-3-pyrrolinyl-1-oxy-3-carboxylic acid;  
2,2,3,3,5,5,6,6-octamethyl-1,4-diazacyclohexyl-1,4-dioxy;  
4-bromo-2,2,6,6-tetramethyl-piperidinyloxy;  
4-chloro-2,2,6,6-tetramethyl-piperidinyloxy;  
4-iodo-2,2,6,6-tetramethyl-piperidinyloxy;  
4-fluoro-2,2,6,6-tetramethyl-piperidinyloxy;  
4-cyano-2,2,6,6-tetramethyl-piperidinyloxy;  
4-carboxy-2,2,6,6-tetramethyl-piperidinyloxy;  
4-carbomethoxy-2,2,6,6-tetramethyl-piperidinyloxy;  
4-carbethoxy-2,2,6,6-tetramethyl-piperidinyloxy;  
4-cyano-4-hydroxy-2,2,6,6-tetramethyl-piperidinyloxy;  
4-methyl-2,2,6,6-tetramethyl-piperidinyloxy;  
4-carbethoxy-4-hydroxy-2,2,6,6-tetramethyl-piperidinyloxy;  
4-hydroxy-4-(1-hydroxypropyl)-2,2,6,6-tetramethyl-piperidinyloxy;  
4-methyl-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;  
4-carboxy-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;  
4-carbomethoxy-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;

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4-carbethoxy-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;

4-amino-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;

4-amido-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;

3,4-diketo-2,2,5,5-tetramethylpyrrolidinyloxy;

3-keto-4-oximino-2,2,5,5-tetramethylpyrrolidinyloxy;

3-keto-4-benzylidene-2,2,5,5-tetramethylpyrrolidinyloxy;

3-keto-4,4-dibromo-2,2,5,5-tetramethylpyrrolidinyloxy;

2,2,3,3,5,5-hexamethylpyrrolidinyloxy;

3-carboximido-2,2,5,5-tetramethylpyrrolidinyloxy;

3-oximino-2,2,5,5-tetramethylpyrrolidinyloxy;

3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;

3-cyano-3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;

3-carbomethoxy-3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;

3-carbethoxy-3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;

2,2,5,5-tetramethyl-3-carboxamido-2,5-dihydropyrrole-1-oxyl;

2,2,5,5-tetramethyl-3-amino-2,5-dihydropyrrole-1-oxyl;

2,2,5,5-tetramethyl-3-carbethoxy-2,5-dihydropyrrole-1-oxyl;

2,2,5,5-tetramethyl-3-cyano-2,5-dihydropyrrole-1-oxyl;

bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)succinate;

bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)adipate;

bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)sebacate;

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bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)n-butylmalonate;  
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)phthalate;  
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)isophthalate;  
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)terephthalate;  
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)hexahydroterephthalate;  
N,N'-bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)adipamide;  
N-(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)-caprolactam;  
N-(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)-dodecylsuccinimide;  
2,4,6-tris-[N-butyl-N-(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)]-s-triazine; and  
4,4'-ethylenebis(1-oxyl-2,2,6,6-tetramethylpiperazin-3-one).

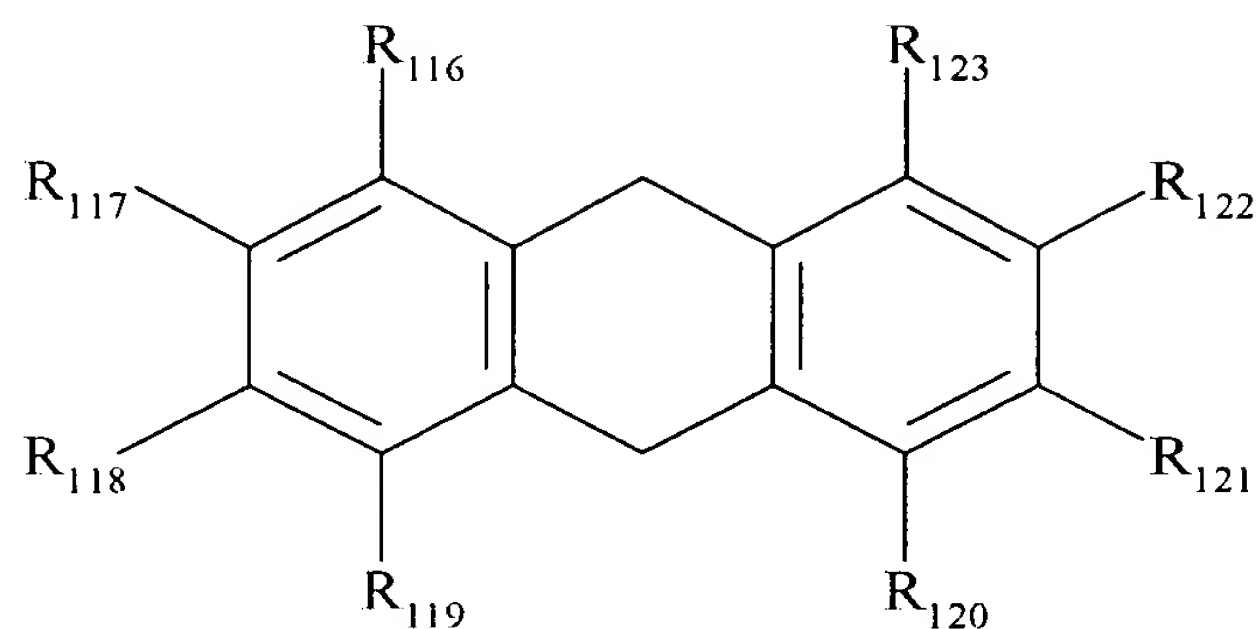
122. (Previously Presented) The method of claim 1 wherein the inhibitor is selected from the group consisting of 2,4-dinitro-6-sec-butylphenol and N-methyl-4-nitroaniline.

123. (Previously Presented) The method of claim 44 wherein the first inhibitor is selected from the group consisting of 2,4-dinitro-6-sec-butylphenol and N-methyl-4-nitroaniline.

124. (New) A method for inhibiting the polymer growth of living vinyl aromatic polymer previously formed in the presence of a nitroxyl inhibitor in admixture with vinyl aromatic monomer, comprising adding to said mixture a living polymer growth inhibiting amount of at

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least one inhibitor of the structure:



wherein

R<sub>116</sub>, R<sub>117</sub>, R<sub>118</sub>, R<sub>119</sub>, R<sub>120</sub>, R<sub>121</sub>, R<sub>122</sub>, and R<sub>123</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR<sub>110</sub>, NR<sub>110</sub>R<sub>111</sub>, SR<sub>110</sub>, NO<sub>2</sub>, NO, CN, COR<sub>112</sub>, halogen, and/or any two adjacent groups can be taken together to form ring structure(s) of five to seven members;

R<sub>110</sub> and R<sub>111</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and COR<sub>102</sub> or R<sub>110</sub> and R<sub>111</sub> can be taken together to form a ring structure of five to seven members;

R<sub>112</sub> is R<sub>102</sub>, OR<sub>102</sub>, or NR<sub>102</sub>R<sub>103</sub>; and

R<sub>102</sub> and R<sub>103</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C,



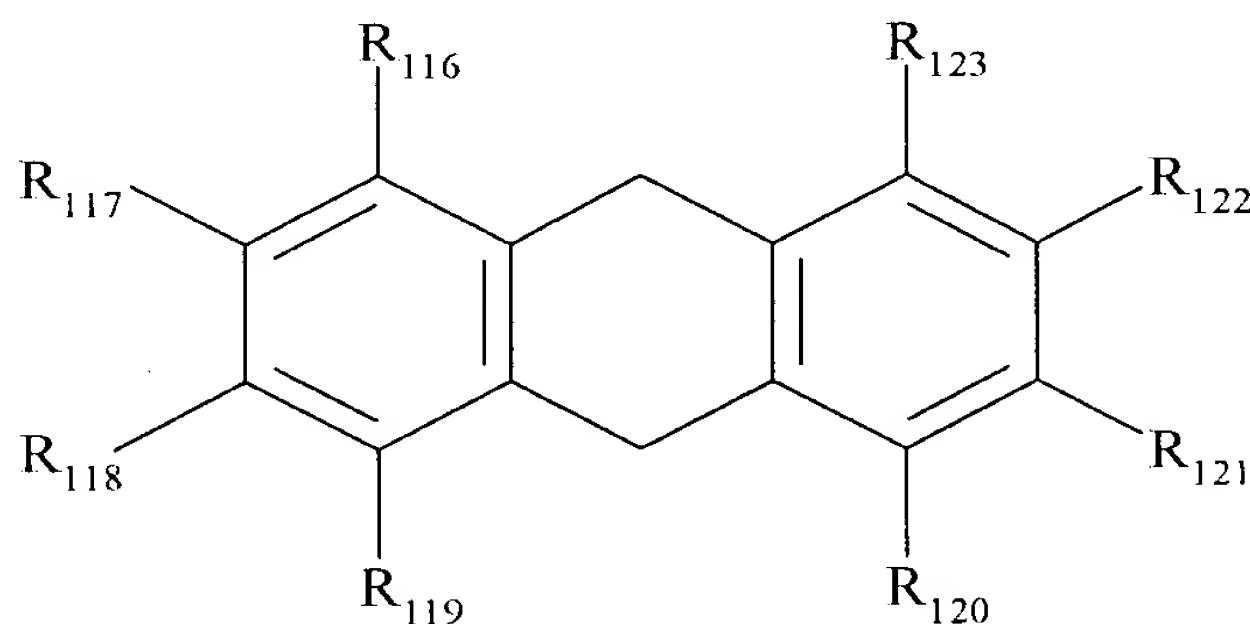
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O, N, S, or P, or  $R_{102}$  and  $R_{103}$  can be taken together to form a ring structure of five to seven members;

wherein said inhibitor is not present during the formation of the living vinyl aromatic polymer.

125. (New) A method for inhibiting the polymer growth of living vinyl aromatic polymer previously formed in the presence of a nitroxyl inhibitor in admixture with vinyl aromatic monomer, comprising adding to said mixture:

A) a living polymer growth inhibiting amount of at least one first inhibitor of the structure:



wherein

$R_{116}$ ,  $R_{117}$ ,  $R_{118}$ ,  $R_{119}$ ,  $R_{120}$ ,  $R_{121}$ ,  $R_{122}$ , and  $R_{123}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl,  $OR_{110}$ ,  $NR_{110}R_{111}$ ,  $SR_{110}$ ,  $NO_2$ ,  $NO$ ,  $CN$ ,  $COR_{112}$ , halogen, and/or any two adjacent groups can be taken together to form ring structure(s) of five to seven members;

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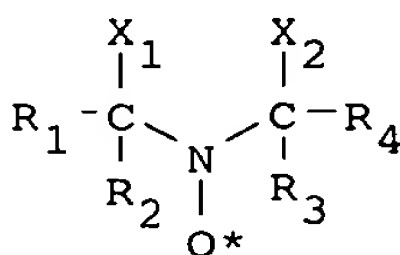
$R_{110}$  and  $R_{111}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and  $COR_{102}$  or  $R_{110}$  and  $R_{111}$  can be taken together to form a ring structure of five to seven members;

$R_{112}$  is  $R_{102}$ ,  $OR_{102}$ , or  $NR_{102}R_{103}$ ; and

$R_{102}$  and  $R_{103}$  are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or  $R_{102}$  and  $R_{103}$  can be taken together to form a ring structure of five to seven members;

wherein said inhibitor is not present during the formation of the living vinyl aromatic polymer;  
and

B) at least one second inhibitor having the following structural formula:



wherein

$R_1$  and  $R_4$  are independently selected from the group consisting of hydrogen, alkyl, and heteroatom-substituted alkyl;

$R_2$  and  $R_3$  are independently selected from the group consisting of alkyl and heteroatom-substituted alkyl; and

$X_1$  and  $X_2$

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- (1) are independently selected from the group consisting of halogen, cyano, amido,  $-S-C_6H_5$ ,  
carbonyl, alkenyl, alkyl of 1 to 15 carbon atoms,  $COOR_7$ ,  $-S-COR_7$ , and  $-OCOR_7$ ,  
wherein  $R_7$  is alkyl or aryl, or
- (2) taken together, form a ring structure with the nitrogen.